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Dear Sir:

In a historic decision, President Truman has now directed the United States Atomic Energy Commission "to continue its work on all forms of atomic weapons, including the so-called hydrogen bomb". Whether it is to be a deuterium bomb (AEN 1/31/50, p. 1), or whether tritium (radioactive isotope of hydrogen) is to be a basic ingredient, much research remains to be done. So enormous will its destructive power be, that in New York last week a group of the country's leading physicists, while sanctioning its construction, called for a pledge that the United States never use the hydrogen bomb in warfare unless others attack with it. They warned that "it is no longer a weapon of war, but a means of exterminating whole populations". The group included Professor Samuel K. Allison, Director of the Institute for Nuclear Studies at the University of Chicago, Professor Hans Bethe, of Cornell University, and Dr. C. C. Lauritsen, Director of the Kellogg Radiation Laboratory, California Institute of Technology.

"Damage From Atomic Explosion & Design of Protective Structures", a forty page report prepared at Los Alamos, has now been sent by the National Security Resources Board to state Governors for their guidance. Concern should be with blast-resistant design, the report states, and recommends that designers of new multi-story reinforced concrete or steel frame buildings assume a horizontal wind component of ninety pounds per square foot, and a vertical component of seventy pounds per square foot. These standards will provide protection against structural collapse from an atomic bomb releasing energy equivalent to 20,000 tons of TNT, exploding at a horizontal distance of one-half mile, and a height of approximately 2,000-feet. Key industries and installations should go underground into caves, mines, or newly excavated sites, for a high degree of protection against the atomic bomb, the report advises, estimating that there are 520,000,000 square feet of floor space available in mines of suitable type in the United States.

"Nuclear Science & the Radio Engineer", sponsored by the Professional Group on Nuclear Science of the Institute of Radio Engineers, will be one of the seven especially planned symposia at the IRE's National Convention, March 6-9, in New York.

The progress of nuclear energy in France will be described by M. Kowarsky, of the French Atomic Energy Commission, and a paper will be presented on nuclear fission by Sir John Cockcroft, director of the British Atomic Energy Research Establishment, Harwell, at the Fourth World Power Conference, to be held in London, July 10-15, 1950.

Commanding the U.S. Air Force units participating in the new atomic weapons tests at Eniwetok Atoll, will be Maj. Gen. R. M. Lee, who last week was named to direct the Air Force's part in the tests. Meanwhile, preparations for proof-testing at Eniwetok, which include providing more adequate technical facilities, and replacing weather damaged structures, are reaching an advanced stage.

Subscription rates: United States, U.S. possessions, and Canada, $18.00 a year. Latin America $20.00 a year. All other countries, $25.00 a year.

AT THE ATOMIC CITIES AND CENTERS IN THE UNITED STATES...

OAK RIDGE, Tennessee- Funds for the new uranium-235 producer plant here at Oak Ridge (AEN 11/8/49 & 12/6/49, each p. 2), were cleared by the House Appropriations Committee in Washington last week. However, it cut by 10% the amount President Truman had requested, recommending $78,885,000.00 in additional contract authority for the AEC for the 1950 fiscal year. Largest single project to be benefited by this additional contract authority, the new Oak Ridge U-235 plant (K-31), will be the fourth such gaseous diffusion facility here.

Oak Ridge production units (which turn out uranium-235 from the K-25 & K-27 facilities) will continue at their present intensified and streamlined levels, according to C. E. Center, superintendent of the Carbide & Carbon Chemicals Division installations here. There will be no work let up, he noted, despite the opening of new areas of activity in production and research at AEC facilities caused by the decision to produce the hydrogen bomb.

A group of scientists from 17 states, India, and Belgium are now enrolled in the 13th course in basic radioisotope techniques to be given by the Oak Ridge Institute of Nuclear Studies here. After techniques have been acquired, these scientists plan to use radioisotopes in such ways as: diagnostic and therapeutic work in medicine; to study the ammoniation of superphosphate; bacteriology, immunology, and physiology studies; to trace the movement of carbon-14 in conjunction with elaborated plant foods; and metallurgical studies...This Summer, during June, July, and August, additional courses will be given by the Institute, in basic radioisotope techniques. Additional information may be secured from the Institute at P. O. Box 117, Oak Ridge.

LOS ALAMOS, New Mexico- Some indication of the continuing growth of atomic energy installations under the AEC's Santa Fe Operations Office (quartered at Los Alamos) is given by that office's latest employment figures. Now, there are almost 2,000 more people working in its facilities than it had on April 1st, 1949, for a total of 12,860. While the Los Alamos Scientific Laboratories now employ approximately 7,900-practically unchanged from April- Sandia Base, the atomic weapons assembly point, and the fairly new Kansas City project, with 3,000 and 1,300, respectively, both registered significant gains.

Dr. Klaus Fuchs, British physicist, was at Los Alamos from December, 1944, to June, 1946. During that period he had access to all weapons information, according to Elmo Morgan, assistant manager for the AEC at Los Alamos. (A confession attributed to Dr. Fuchs, and introduced at his arraignment last week in London, revealed that he had transmitted classified information on nuclear work to the Soviet Union from 1942 on, and that he had only stopped about a year ago. Dr. Fuchs, in charge of work in theoretical physics at the Atomic Energy Research Establishment, Harwell, is accused specifically of betraying such information to foreign agents in violation of the British Official Secrets Act of 1911 & 1939.)

BROOKHAVEN NATIONAL LABORATORY, Upton, New York- At a five day session on "Insurance Aspects of Health Physics", held here last week, about 100 insurance engineers were given advanced and detailed information on health problems involved in the distribution and use of radioisotopes. About 39 U. S. casualty companies were represented. Brookhaven's Health Physics Division arranged and directed the course; cooperating units were the AEC, and the Joint Casualty Committee on Radiation, representing the casualty insurance companies.

ARCO, Idaho- With the recent pouring of concrete footings for the building to house the experimental breeder reactor, at the nuclear reactor testing station here, first above-ground work begins on this reactor, for which about $2,500,000.00 will be spent on-the-site. Contract for erecting the reactor structure (steel, brick, and concrete), as well as for the control, ventilating and auxiliary equipment, was recently awarded to Bechtel Corporation, of San Francisco. Structural steel will be provided by the Judson-Pacific Murphy Corp., Emeryville, Calif., and will be erected by the Paramount Steel Corp., Long Beach, Calif...On a bid of $125,000.00, Morrison-Knudsen Co., Boise, Idaho, has been awarded a contract to provide concrete aggregate for construction work here. Twenty-six firms bid for the job, the largest number thus far to submit proposals on work opened to bid.

PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

Aerial prospecting- Carrying nineteen closely bundled Geiger tubes, a plane used for radioactive mineral prospecting by the U. S. Geological Survey has been able to detect ground deposits when the aircraft has been at heights above 500 feet, Dr. Frank Stead of the USGS told the annual meeting of the American Institute of Electrical Engineers last week in New York. Additional detection devices include air sampling for traces of radioactive decay products. The air is drawn into the aircraft by an airscoop, where it is checked for ionization properties. A radar altimeter, and continuous strip camera record the exact location of the ground deposit at the time of detection. Automobiles with radiation detection devices on their roofs were also described by Dr. Stead. Some 28,000 miles of roads in the Colorado Plateau area have been covered during investigations there by this method, he said.

Nuclear reactor control - A nuclear reactor designed to produce useful power can be controlled by a properly designed automatic control system, Dr. J. M. Harrer, of Argonne National Laboratory, Chicago, told this AIEE meeting (above). Such an automatic control system must introduce the control rods quickly enough, and at the right time, to keep the neutron level at the peak power-producing level without danger. There is this control problem, Dr. Harrer declared, and the fact that a nuclear reactor must operate at very high temperatures and pressures. However, he observed, the power producing nuclear cycle is not much different from a coal or oil fired system.

FROM THE MANUFACTURERS- An enlarged list of tagged compounds. Includes 50 compounds tagged with carbon-14, and over 300 compounds, both organic and inorganic, which are tagged with about 25 other radioisotopes, as well as 24 deuterated compounds. Other tagged compounds will be synthesized on special order.--Tracerlab, Inc., 130 High St., Boston 10, Mass.

New metal-ceramic materials, a mixture of metals and ceramics, and which may find possible applications in nuclear reactors or thermo-nuclear devices. Manufacturer states materials have unique physical characteristics, especially at elevated temperatures, with high thermal shock resistance, high strength at elevated temperatures, and good abrasion resistance. Of intermediate electrical and thermal conductivity.--P. R. Mallory & Co., Special Metals Division, 3029 E. Washington St., Indianapolis 6, Ind.

New 24 mev betatron, specifically designed for deep radiation medical therapy. Trunnion mounted, with controls for precise angulation. Manufacturer states it embodies features suggested by medical centers now using this maker's 22 mev betatron in research and development.--Allis-Chalmers Mfg. Co., 1126 S. 70th St., Milwaukee 1, Wisconsin.

Lead-bonded plywood for radiation shielding. Lead veneer, available in thicknesses from 1/8" to 3", which manufacturer states is permanently bonded to the plywood. The plywood veneer provides a finished cabinet exterior for instruments, panels, etc. Available flat or curved, in sizes and thicknesses as specified.--Keller Products, Inc., Manchester, N. H.

Beta-gamma portable count rate meter, model 2610A. New model, in water-tight case; circuit components tropicalized. Water-tight probe, with plug-in type Geiger tube to facilitate servicing. Meter calibrated in both mr/hr., and counts per minute. Supplied complete with attached radioactive source for checking calibration, batteries, and crystal earphone--Nuclear Instrument & Chemical Corp., 223 W. Erie St., Chicago 10, Ill.

Radioactive ore detector, model 106. Designed for field use. Tropicalized and weatherproofed; uses low cost batteries. Employs a 900 volt Geiger tube with a 30 mg./sq. cm. thin window section. Disintegrations shown by neon flasher, earphones, and three-range, single-face meter indicating 20, 2, and 0.2 mr/hr. Weight: approx. 3½ lbs. Size: 3½" x 4" x 6½". Supplied complete with batteries, earphone, and carrying belt.--Precision Radiation Instruments, Inc., 5478 Wilshire Blvd., Los Angeles 36, California.

ATOMIC PATENT DIGEST...latest U. S. & British applications & grants...

Special Note- An application has been filed with the Patent Compensation Board, of the U. S. Atomic Energy Commission, by Glenn T. Seaborg, Joseph W. Kennedy, Arthur C. Wahl, and Emilio G. Segre, for "just compensation and/or award". The application is based on certain reports, and patent applications numbers 637,484-5-6 & 7, and 750, 175, on "Transuranic element, composition thereof, and method for producing, separating, and purifying same."

New patents- Radiant energy activation. A method for indicating conditions within a borehole: (1) Radioactive material is introduced in such a manner that it is retained within the borehole, (2) Radioactive intensity at different portions of the borehole is measured, (3) Using the measurements so obtained, the locality of the material is indicated, and conditions within the borehole are shown. U. S. Pat. No. 2,495,736, issued Jan. 31st, 1950, to S. Krasnow, and L. F. Curtiss, assignor by mesne assignment to said Krasnow.

Shield for well logging instrument. Consists of a separable cylindrical shield, of a radiation absorbing substance, which is adapted to surround the exterior of a well logging instrument having an irradiation source emitting penetrating nuclear radiation. U. S. Pat. No. 2,495,781, issued Jan. 31st, 1950, and assigned to Stanolind Oil and Gas Co., Tulsa, Okla.

Ionization chamber. Includes a pair of spaced parallel plates adapted to define an electrical field, a sample holder, and a removable end plate. One of the plates is wire mesh, and is carried by the end plate in overlying relationship to the sample holder. U. S. Pat. No. 2,496,123, issued Jan. 31st, 1950, to J. K. East, and S. G. English, and assigned to the United States of America (USAEC).

Pulse generator. An apparatus for producing an accurately known number of electrical pulses. Comprises, (1) Pulse generating means producing known integral number of pulses per cycle of the alternating curent used, (2) Controlling pulses by an electronic gate connected between the generating means and the output, and (3) Means responsive to the alternating current, and governing the operation of the gate for a predetermined number of cycles of the said A.C. U. S. Pat. No. 2,496,819, issued Feb. 7th, 1950, to A. R. Simpson, and assigned to the United States of America (USAEC).

Radiation alarm and measurement device. An apparatus for detecting and measuring radioactivity. Comprises an ionization chamber circuit adapted to produce a voltage proportional to the radioactivity under measurement. U. S. Pat. No. 2,496,886, issued Feb. 7th, 1950, to E. W. Molloy, and W. H. Hinch, and assigned to the United States of Ameria (USAEC).

BOOKS & OTHER PUBLICATIONS...in the nuclear field...

Medical Physics, Vol. II. Edited by Otto Glasser, biophysicist at the Cleveland Clinic Foundation. Phases of nuclear energy in the medical sciences. 1350 pages, 978 illus.--Year Book Publishers, Chicago, Ill. ($25.00)

Elementary Pile Theory, by H. Soodak and E. C. Campbell. Material originally presented in lectures at the Clinton Laboratories (now Oak Ridge National Laboratories). 76 pages, 23 illus. -- John Wiley & Sons, New York 16, N.Y. ($2.50)

The Freezing Point of Uranium, by A. I. Dahl, and H. E. Cleaves. Investigations conducted at the National Bureau of Standards. Research paper No. RP-2042. -- Superintendent of Documents, Washington 25, D. C. (5¢)..

Research reports from AEC-supported laboratories, made available the last quarter of 1949. Comprise: 16 reports in chemistry; 19, on instruments; 16, in physics; 10, in biology and medicine; and 3, in metallurgy and ceramics. To obtain titles, costs, etc., refer to list no. 15, dated January 1950, and write: Technical Information Division, USAEC, Document Sales Agency, P. O. Box 62, Oak Ridge, Tenn.

Counting Tubes, by S. C. Curran, Department of Natural Philosophy, Glasgow University, and J. D. Craggs, Department of Electrical Engineering, Liverpool University. Theory and application of ionization chambers, proportional counters, etc. 225 pages, 119 figs. -- Academic Press, Inc., New York 10, N. Y. ($5.50).

IONIZING RADIATION...investigations & notes...

Samples of undyed cellulose acetate yarn were exposed to radiation from a 50 kVp, 30 ma. copper target X-ray tube, for periods up to 190 hours, in an effort to determine possible modifications in physical properties of the yarn by such irradiation. The work was done at the research laboratories of Lansil, Ltd., Lancaster (England), by N. W. Winogradoff. It was found that the tensile strength of the yarn decreased to less than 50% of its original strength after 120 hours. Photomicrographs and diffraction patterns taken after 20 to 40 hours exposure suggest that such irradiation decreases the crystallinity of the material. However, Winogradoff believes that chemical and structural changes may take place in these substances during the long exposure required for X-ray diffraction patterns, and may influence the diagram.

The effect of 200 r whole body X-irradiation on the guinea pig has been investigated by T. J. Haley, and D. Harriette Harris, of the Medical School, University of California at Los Angeles. Using 66 control, and 64 irradiated animals, total leukocyte and differential counts, coagulation time, and body weights were determined twice weekly until the irradiated animals showed signs of recovery. The experimenters found that the guinea pig responds similarly to other animals subjected to X-irradiation. They believe that for many purposes the guinea pig is much more suitable for such studies than the mouse or rat, and that dependable results can be obtained using this animal since its size and general temperament are suitable for studies employing large numbers of animals. Recommended by these workers, however, is that all hematological studies be reported in both relative and absolute terms to avoid a misinterpretation of the results observed.

An investigation of the physiological effects of non-isotopic uranium has been made by W. F. Neuman, M. W. Neuman, and B. J. Mulryan, of the Department of Radiation Biology, School of Medicine & Dentistry, University of Rochester. In an earlier study, uranyl nitrate enriched with the alpha-emitter U-233 had been administered intraperitoneally to young rats, to permit a simultaneous radioautographic and microscopic study of sections of femur. It was observed that the resorptive processes in the bones of these animals were inhibited. In the present work, rats were injected intraperitoneally with non-isotopic uranyl nitrate. The total dose of uranium injected in all cases was larger than that containing U-233 in the previous experiments. Roentgenograms of the two hind legs of the animals revealed no inhibition of the resorptive processes. The experimenters have concluded that the inhibition of the resorptive processes observed previously was not caused by any specific chemical effect of the uranium, but rather by radiation.

RADIOISOTOPES...latest tracer applications...

Using radioactive gallium (gallium-72), further work has been undertaken on the physiological characteristics of this isotope by H. C. Dudley, J. I. Munn, and Katherine E. Henry, of the National Naval Medical Center, Bethesda, Md. Using radiogallium citrate, studies were made of the distribution of gallium following subcutaneous injection in the rat, rabbit and dog. It was found that only bone and kidneys receive large amounts of the element, other soft tissues receiving no significant concentrations.

Making use of phosphorous-32 produced in the nuclear reactor at Harwell, Dr. G. S. Hartley, chemical research manager of Pest Control, Ltd., (England), is endeavoring to determine the action of the firm's insecticide "Pestox", both in plants and after it has been absorbed by various insects. Apart from its primary objectives, the tracer technique has already indicated methods whereby the production processes for the material can be improved.

Sincerely,

The Staff,
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